MS2000

Electronic Steam Humidifiers

MiniSteam Residential Owner's Manual

Read and Save these Instructions

DGH

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Limited Warranty

All Products manufactured by DGH Systems, L.L.C. are warranted to the original purchaser to be free from defects in materials and workmanship in the course of normal and reasonable use for a period of 2 years from the date of installation or 2 years and 1 month from the date of shipment, whichever comes first, so long as the product has been installed and operated in accordance with all appropriate manuals and wiring diagrams.

Any product or part that is found to be defective will, at the option of DGH Systems, L.L.C. be replaced or repaired. DGH Systems, L.L.C. reserves the right to inspect any part or installation before replacing or repairing defective parts. After startup of the product, labor for repairs or replacement of parts is not covered by this warranty. Replacement of routinely replaceable parts such steam cylinders and gaskets are not covered by this warranty.

DGH Systems, L.L.C. assumes no liability for consequential or inconsequential damage, or damage due to negligence or improper use. Under the terms of this warranty, the original purchaser may have certain legal rights and other rights which may vary from state to state.

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Your *MiniSteam* steam humidifier will consist of:

For duct mounted applications (Figure 1):

- *1 Steam humidifier unit*
- *1 Duct steam nozzle*
- *10' - 7/8" ID steam hose*
- *2 Steam hose clamps*
- *10' - 5/16" ID condensate hose*
- *1 Condensate hose clamp*
- *1 HC-101 humidistat*
- *1 PC-301 air proving switch*
- *2 Fill cup extenders*
- *3 Screws and anchors*
- *1 Fill connector*

Figure 2

Figure 1

For room mounted applications (Figure 2):

- *1 Steam humidifier unit with blower attached*
- *1 HC-101 humidistat*
- *3 Screws and anchors*
- *1 Fill connector*

IMPORTANT: BEFORE beginning installation:

- *Check for shipping damage to cartons. Mark the shipping waybill accordingly.*
- *Open cartons and check for any hidden damage. Mark the shipping waybill accordingly.*
- *Check packing slip to insure all items have been received. Notify DGH immediately of any shortages or damaged parts. You must notify DGH within 5 working days of any shortages.*

Installation - Mounting the Humidifier

1. *Open the carton and carefully remove the humidifier and accessories.*

2. *Open the humidifier, using a flat blade screwdriver, and remove the mounting hardware and accessories.*

3. *Remove the plastic steam cylinder by loosening the clamp on the top left of the cylinder and lifting the cylinder while twisting it up out of its base.*

   a. *Disconnect the wires on top by carefully loosening and removing the plastic knobs holding them in place. Carefully use a pliers if necessary to loosen the knobs.*

   CAUTION: *Do not squeeze the pliers too hard, and turn counter-clockwise only.*

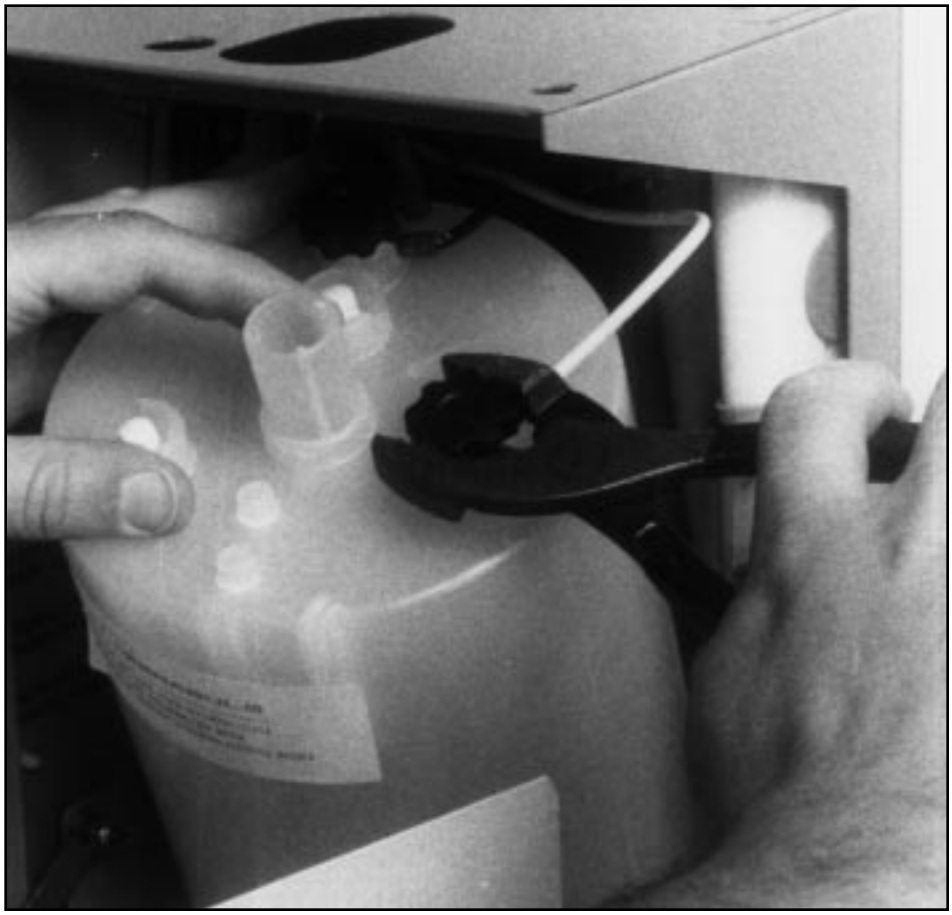

Figure 3

4. *Locate where you will install the duct steam nozzle in the duct (if used), and then decide on a convenient location for the humidifier, that will permit the hoses to be sloped properly.*

5. *Use the mounting bracket to mark the wall for drilling. Use a level to insure the unit will hang level. (See Figure 4 at right)*

CAUTION: *make sure that the screws will go into wall studs to support the weight of the humidifier.*

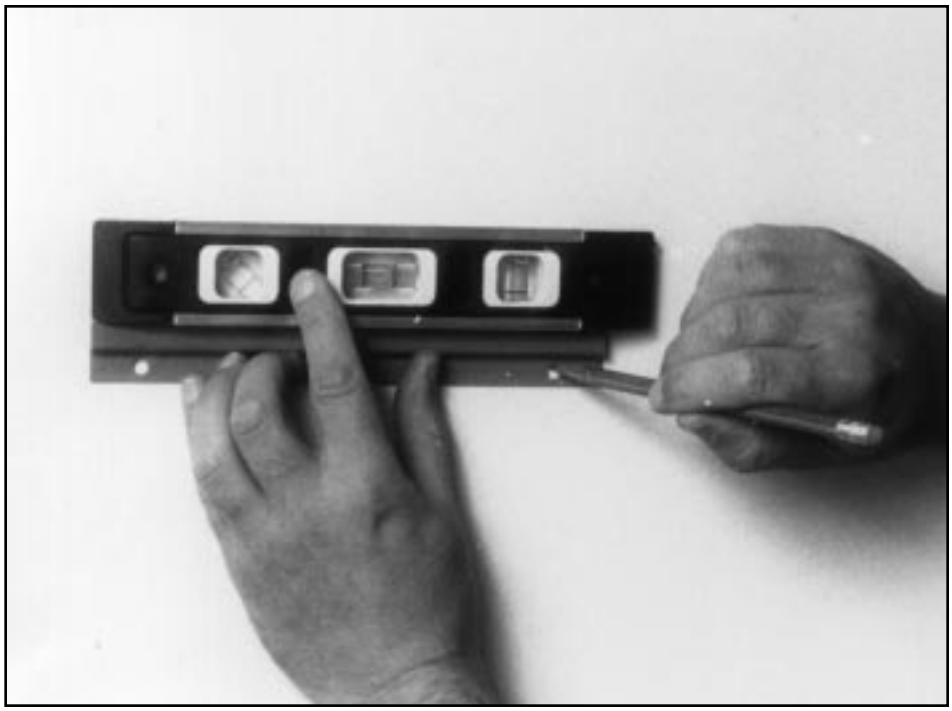

Figure 4

Figure 5

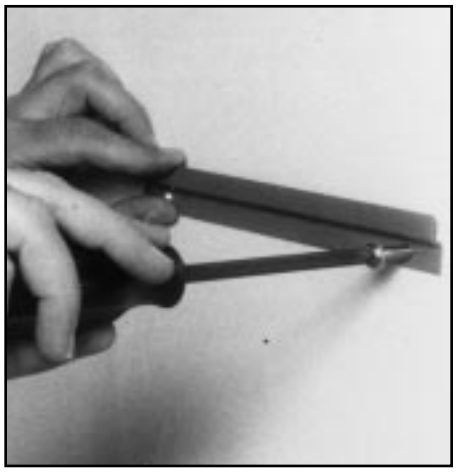

Figure 6

6. *If the mounting screws will be screwed into wood, drill 2 -$^{1}/_{8}$" pilot holes for the mounting bracket. If dry wall, drill 2 -$^{5}/_{16}$" holes for the anchors. (See Figure 5 above)*

7. *Insert the screw anchors if needed and then screw in the mounting screws through the bracket. The top edge of the bracket should stand out away from the wall. (See Figure 6 above)*

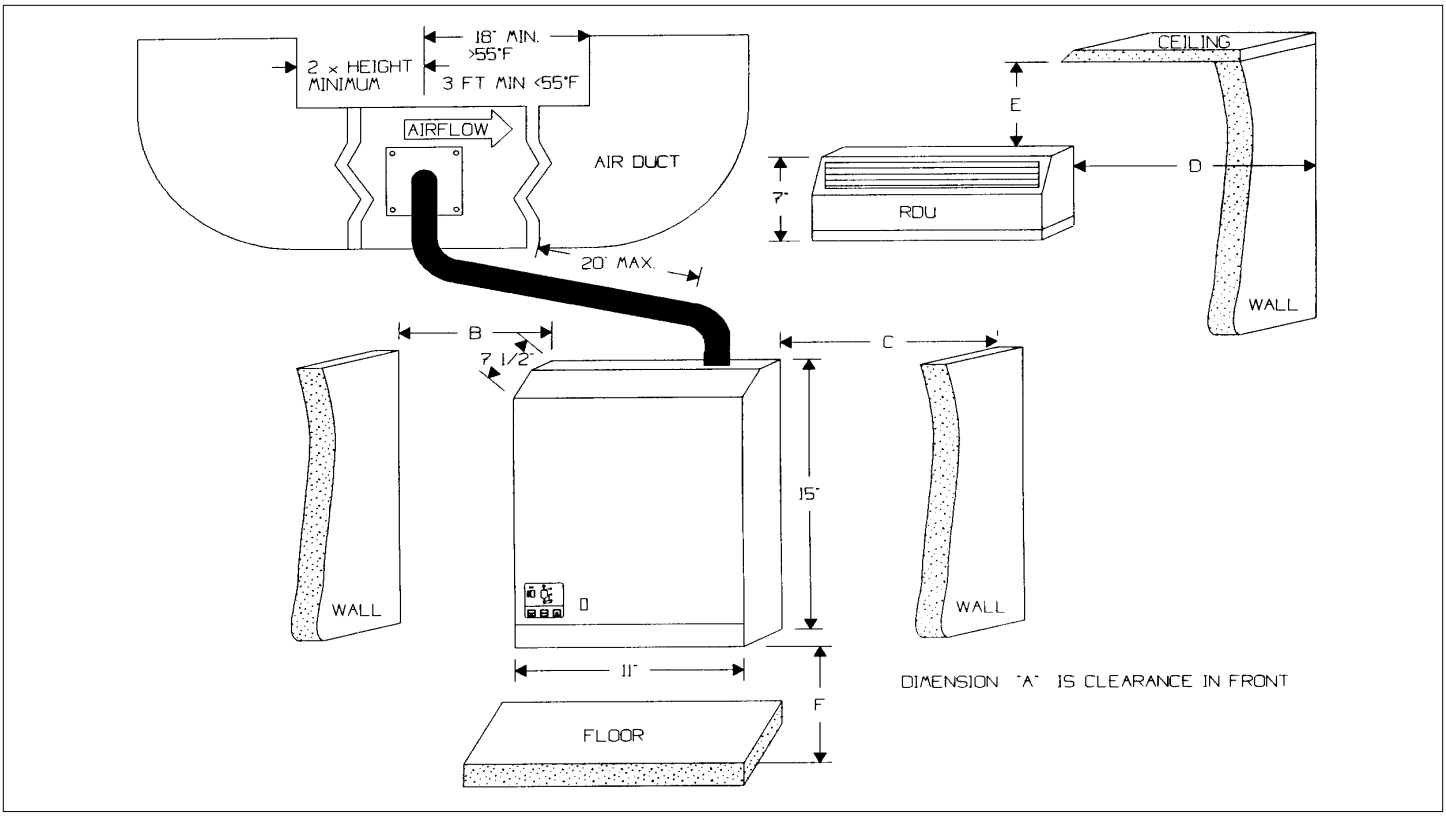

Figure 7

DIMENSIONS:

A =*Clearance in front of humidifier 36" (72" with blower)*

B =*Clearance to left side of humidifier 12"*

C =*Clearance to right side of humidifier 12"*

D =*Clearance to right side of blower unit 12"*

E =*Clearance from top of blower to ceiling 24"*

F =*Clearance from bottom of humidifier to floor 12"*

IMPORTANT: *Maximum length of rubber steam hose is 20 feet. 10 feet is supplied with the humidifier.*

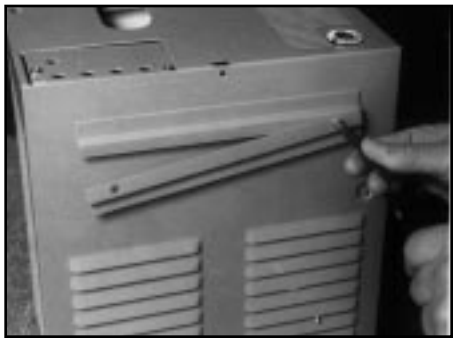

Figure 8

9. *Remove the mounting bracket from the back of the humidifier Mount the humidifier unit as close to the steam distributor pipe as possible to minimize condensate. Mount the humidifier unit below the steam distributor pipe whenever possible. Insure that a slope can be maintained in the steam hoses. Certain mounting clearances must be maintained to allow access for maintenance, and for steam discharge from the blower unit:*

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10. *Hang the humidifier unit carefully on the mounting bracket. (See Figure 9 at right)*

Figure 9

11. *Secure the bottom of the humidifier unit to the wall using the third screw. (See Figure 10 at right)*

Figure 10

Installation - Mounting the Steam Nozzle

12. *Locate a suitable position for the steam nozzle per Figure 11 at right.*

a. *Locate the nozzle at least 18" upstream of any duct takeoffs or elbows.*

b. *If the steam nozzle is installed from the bottom of the duct, locate it in the center, and cap off the condensate outlet nipple.*

12. *Cut or drill a 2-1/2" hole in the side of the duct to fit the steam nozzle.*

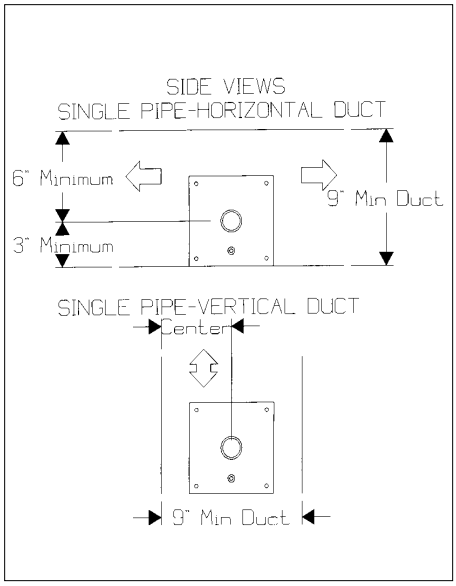


Figure 11

Figure 12

13. *Apply silicone caulk to the faceplate of the steam nozzle and insert it into the duct with the 5/16" outlet nipple at the bottom, as shown in Figure 12 above.*

Figure 13

14. *Attach the steam nozzle to the duct using #10 by 1/2" drill point sheet metal screws (not included). Be sure the nozzle is mounted level, with the 5/16" outlet nipple at the bottom.*
(See Figure 13 above)

Installation - Running the Steam Hose

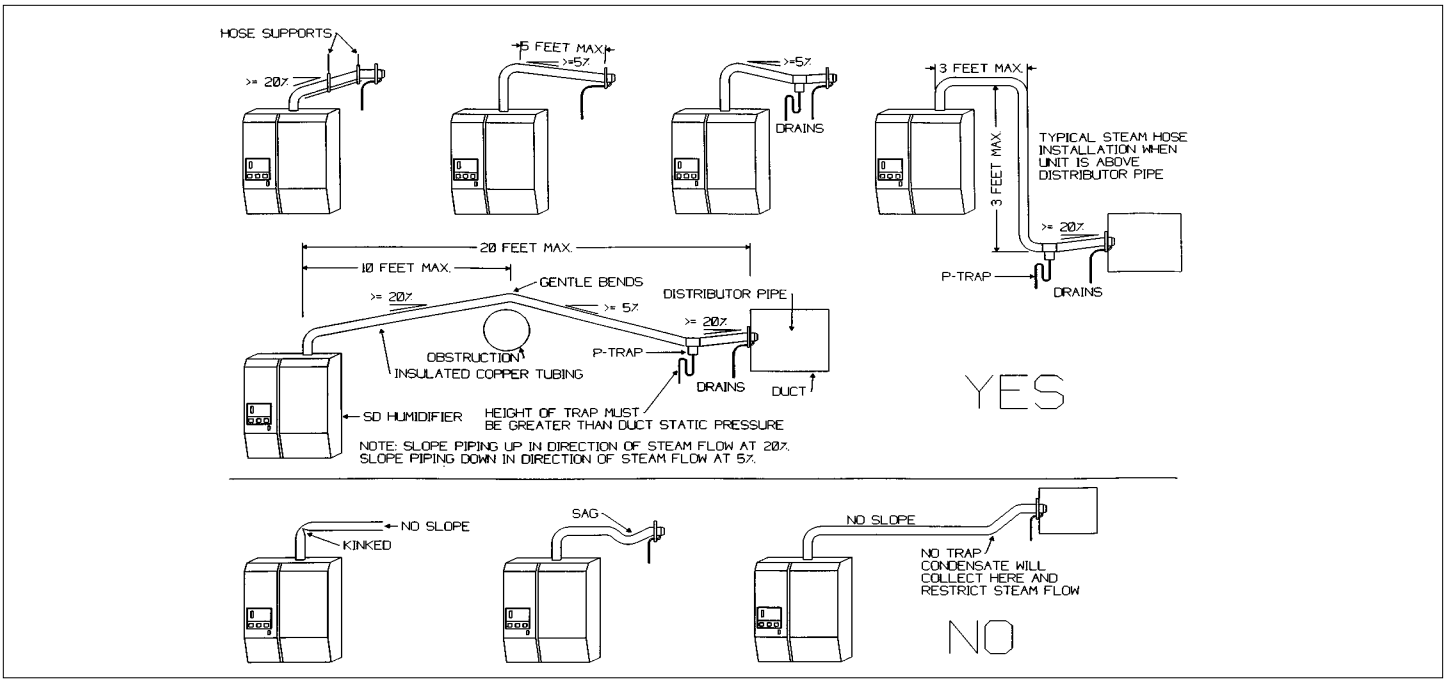


Figure 14

CAUTION: *90% of all operational problems with the MiniSteam humidifier can be traced to improper installation of the steam hose. It is very critical that steam be allowed to flow freely from the humidifier unit to the steam nozzle, and that condensate can flow back.*

- *A 20% slope must be maintained from the humidifier unit to the steam nozzle. That means the hose must slope up 2 1/2" for every foot of the length of the steam hose.*

- *There must be NO sags, kinks or low areas in the steam hose that can collect condensate or otherwise restrict the steam flow.*

- *Copper tubing may be used in place of the steam hose, but it must be a minimum of 7/8" ID and must be insulated.*

  DO NOT REDUCE THE SIZE OF THE STEAM HOSE OR PIPE.

16. *Slip the end of the 7/8" ID rubber steam hose over steam nozzle inlet nipple and secure it with the stainless steel hose clamp supplied.*
(See Figure 15 at right)

17. *Slip the 5/16" ID condensate hose over the steam nozzle condensate outlet nipple and secure it with the plastic hose clamp supplied.*
(See Figure 16 at right)

Figure 15

Figure 16

18. *Bring the end of the steam hose through the hole in the top of the humidifier cabinet and slip the end over the steam cylinder outlet. Secure the hose using the stainless the steel hose clamp supplied. (See Figure 17 at right)*

Figure 17

Figure 18

18. *Reinstall the steam cylinder into the humidifier unit by pressing it down into the O-ring fitting at the bottom, and then securing all wires.*

CAUTION: *Loose electrical connections could cause fire, so make sure all fittings are tight. (See Figure 18 above)*

Figure 19

20. *Bring the end of the condensate hose through the smaller hole in the top of the humidifier cabinet and cut it so it ends in the drain pan of the humidifier. (See Figure 19 above)*

Installation - Plumbing

IMPORTANT: *Softened water with conductivity less than 250 micromhos may be used. Raw water is always recommended. Demineralized water may NOT be used.*

21. *Run 1/4" OD copper tubing from the water source to the bottom of the humidifier unit.*

22. *Attach the 1/4" OD copper water tubing to the compression fitting mounted in the plastic water fill fitting. (See Figure 20 at right)*

Figure 20

Figure 21

23. *Attach the plastic fill fitting, with the 1/4" OD copper tubing, to the fill connection on the bottom of the humidifier.*
HAND TIGHTEN ONLY!
(See Figure 21 above)

Figure 22

24. *Attach a 3/4" CPVC drain line to drain fitting on bottom humidifier unit, using PVC thread sealant to insure a seal.*
USE ONLY CPVC. *Metal fittings may crack the drain pan.*
HAND TIGHTEN ONLY.
(See Figure 22 above)

Installation - Power Wiring

25. *Feed power wires through one of the electrical inlets located on the bottom of the humidifier unit, and tighten the strain relief. (See Figure 23 at right)*

Figure 23

26. *Insert the wires into the proper power wiring terminals and tighten all wires carefully.*

CAUTION: *loose wires can cause fires. Make sure power supply matches unit label.*
(See Figure 24 at right)

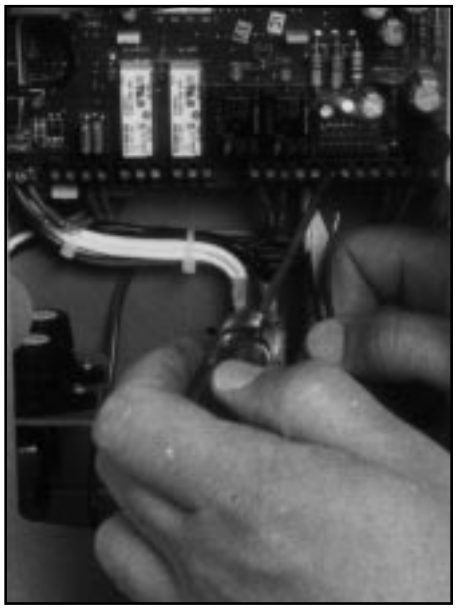
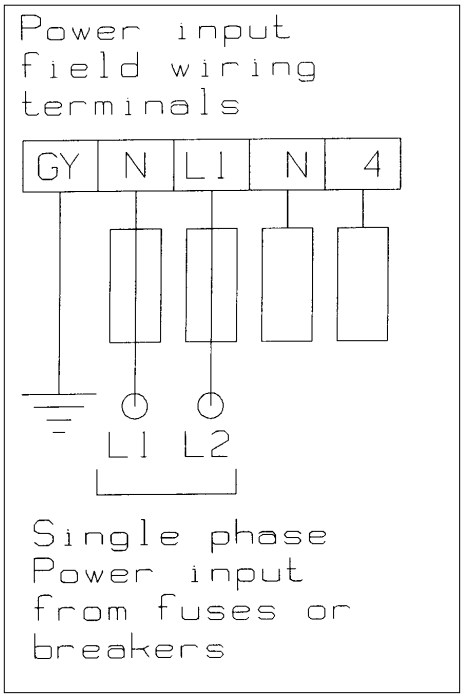


Figure 24



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Installation - Control Wiring

27. *Mounting the airflow switch: Mount the airflow switch in the supply or return duct using the screws supplied.*

Mount the device so that the diaphragm is in a vertical position as shown in Figure 25 below.

Drill a 7/16" hole in the side of the duct and connect the supplied tubing to the high pressure tap on the airflow switch and then run it through the drilled hole in the duct.

Put no more than 2" of tubing into the duct. Caulk around the tubing where it enters the duct. The low pressure tap is left open to atmosphere. Reverse the taps if on the return duct.

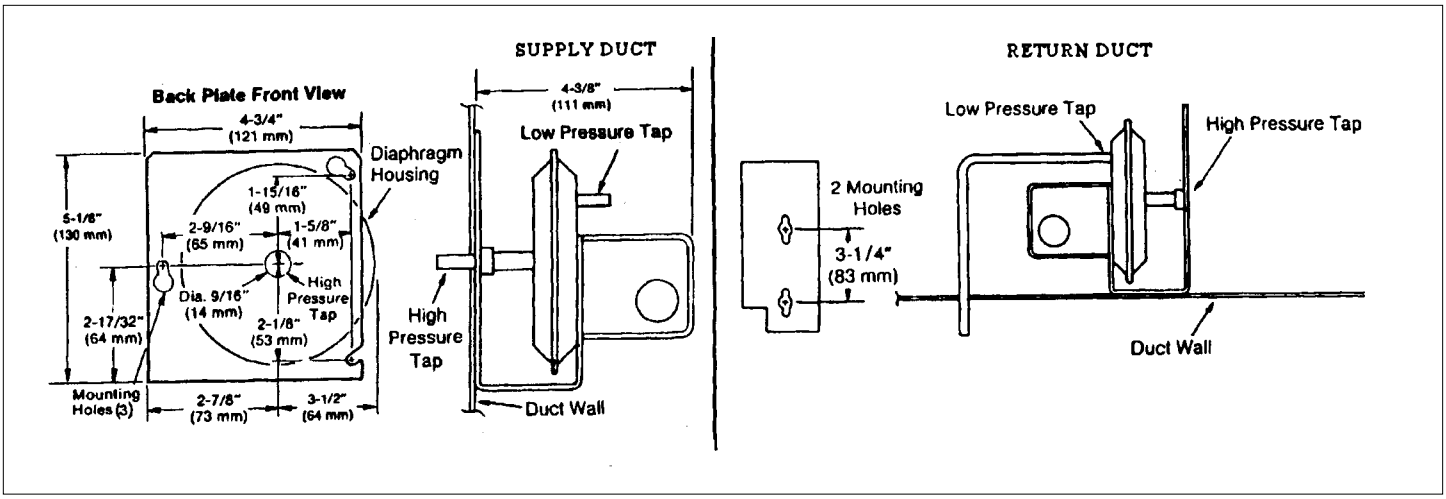

Figure 25

28. *Mounting the On/Off control humidistat: mount the control humidistat to an inside wall or post in the area to be humidified. Position it so that no drafts from registers or outlets are blowing on it.*

Be sure that it is not placed over a device that could generate heat or vapor ie: stove, machinery, cleaning vat. If an optional duct humidity sensor is used, mount it to the return duct only. (See Figure 25 above)

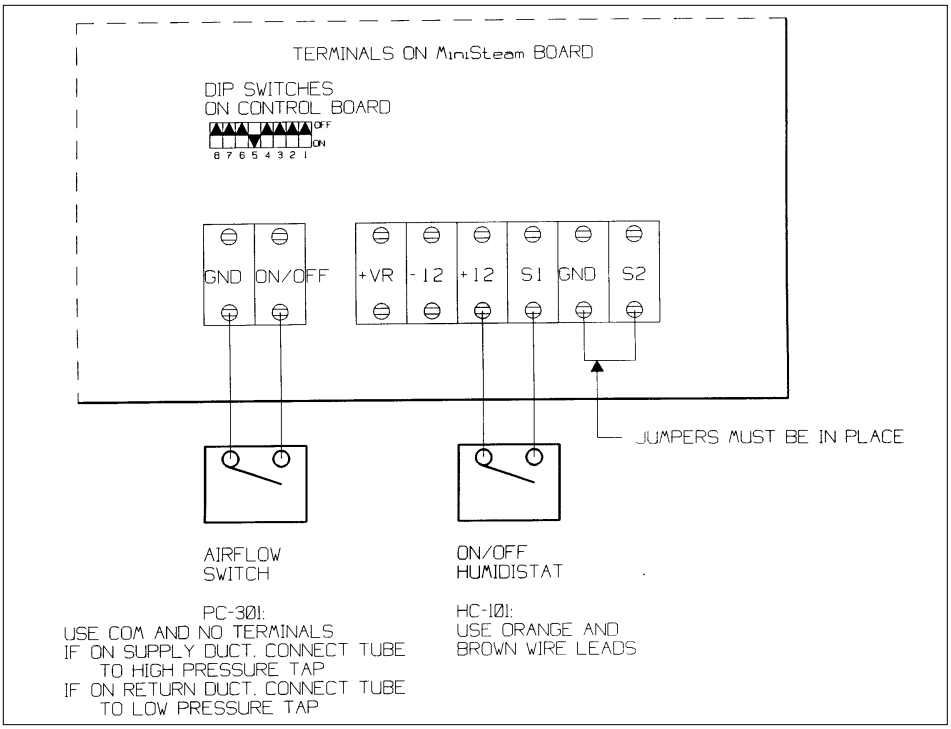

Figure 26

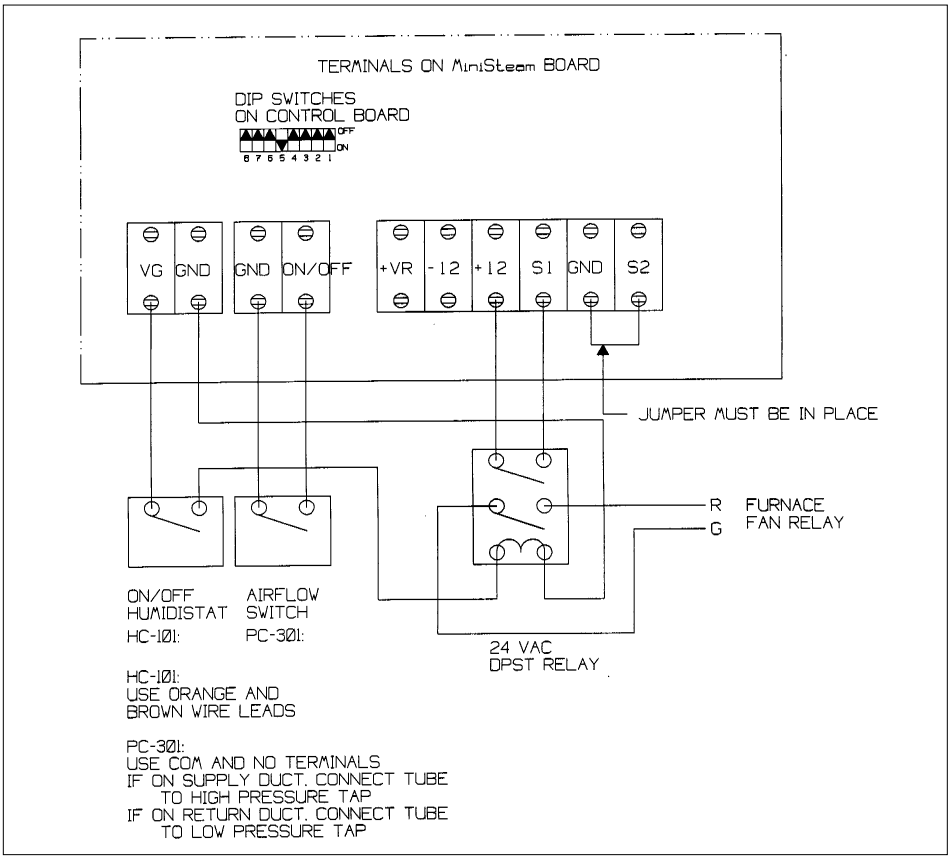

Figure 27

29. *Run control wiring from the humidistat and air flow switch, to the humidifier unit and enter one of the electrical connection fittings on the bottom of the humidifier unit.*

30. *Tighten the strain relief connector around the wires.*

31. *Connect the wires per one of the following control wiring diagrams, directly to the bottom of the circuit board. Figure 26 is the standard wiring diagram. If you desire for the humidifier to activate the heating fan whenever there is a call for humidity, then use the following control wiring scheme instead. A small, 24 Vac DPST relay will be needed. (See Figure 27 below left)*

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Start up and Check out of the SD 2000 Humidifier

Startup Checklist:

❑ *1. Water and drain lines are connected properly. Fittings are tight.*

❑ *2. All power connections, including internal ones, have been checked to insure tightness.*

❑ 3. *Wires to the electrodes on top of the cylinder are tight.*

❑ 4. *Steam and condensate hoses are properly installed and supported to prevent sags. Hose clamps are tight.*

❑ 5. *Humidistat and air flow switch are connected per the instructions.*

Startup Procedures:

1. *Turn on water to the humidifier and check for leaks in the piping.*

2. *With the humidifier On/Off switch in the OFF position, turn on power to the humidifier.*

3. *Set the humidifier On/Off switch to the ON position.*

4. *Set the humidistat setpoint above the room humidity.*

5. *After the ON LED lights up, the FILL LED should light up 15 seconds later, and the unit should open the fill valve and begin to fill with water.*

Filling should stop when either the proper amperage is reached, or the cylinder is full of water. After a few minutes, water should start to boil and steam should be produced.

Startup with low conductivity water: When the water conductivity is less than 100 micromhos, there is not enough conductance in the water for the humidifier to reach even low capacity. In this case, the humidifier will fill completely full, but after 10 minutes it will still not reach a boil. In this case it is necessary to "jump start" the humidifier. Do this by turning the unit off, removing the hose from the top of the cylinder and drop in a teaspoon full of salt or two Alka-Seltzer to raise the water conductivity. Once the unit is brought to a boil, it will be able to automatically take care of maintaining the proper mineral concentration. If the humidifier loses output again within a few hours, contact the factory for a special low conductivity adapter system.

DO NOT USE
DEMINERALIZED WATER.

Operating your MiniSteam Humidifier

Sequence of Operation. (Figure 28) On a call for humidification, the controller (R) will activate the power contactor (A) in the humidifier to put power to the electrodes in the steam generating cylinder (B). After a few seconds, the fill valve (C) will be activated for a minimum of several seconds to admit water to the fill cup (V) and read the conductivity (T). The fill valve will remain open until either the desired amperage draw is reached or the water level reaches the cylinder full probes (E). Boiling will begin and steam will flow to the duct distributor pipes or to the Room Distribution Unit. As water is boiled into steam, the water level will reduce, and so will the amperage draw. When the amperage draw falls below the required level, the fill valve (C) will be opened and water will be admitted to the cylinder to increase the amperage draw to the required level.

Periodically, based on the water conductivity and the rate of boiling, the controller will activate the drain valve (S) for a short period of time to drain some of the mineral laden water away (S), followed by activation of the fill valve (C) to replenish and dilute the water in the steam generating cylinder.

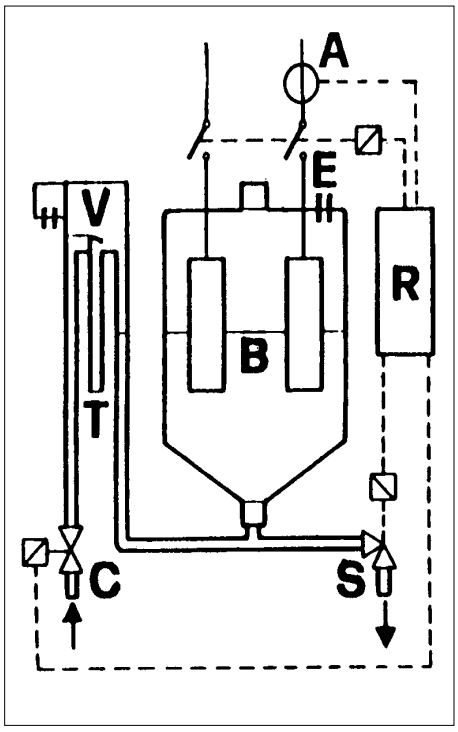

Figure 28

The MiniSteam Controller

Your MiniSteam humidifier has one of the most advanced controllers of any humidifier. It automatically controls drain and fill rates for the most efficient operation possible.

The front of the controller provides a graphic to show unit operation, and three buttons to control functions.

Setting Maximum Steam Output: Press the UP key (#2 fig 29) until the appropriate LED on the output graph lights up. Once for 30%, two times for 50%, three times for 75%, and four times for 100%. This setting can be used to reduce the output of the humidifier for applications where the full output may not be needed.

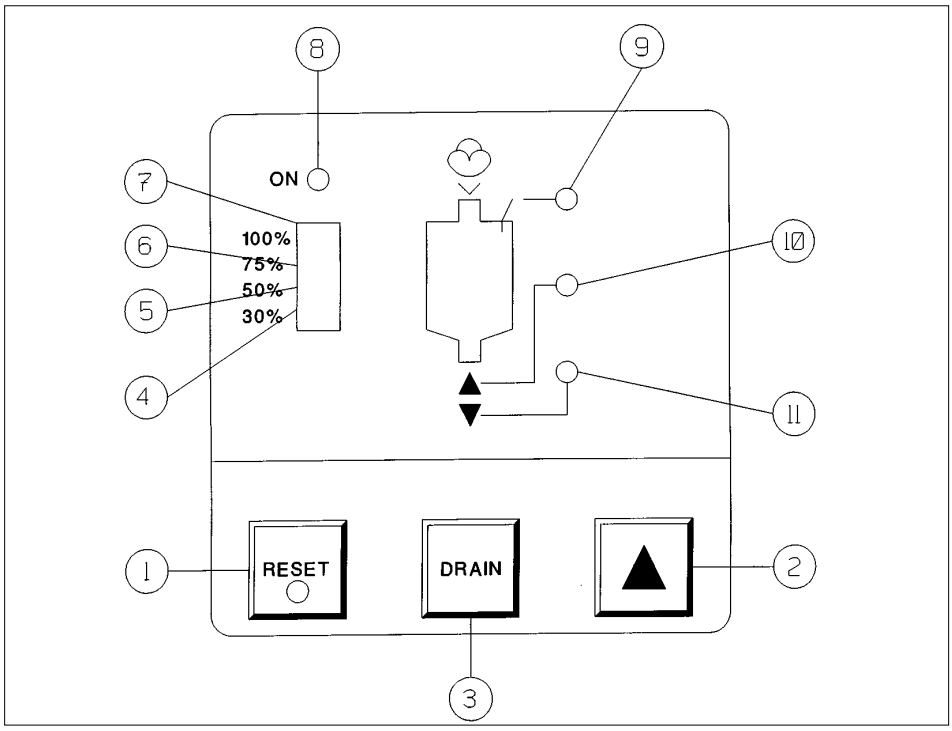

Figure 29

The controller parts are:

1. *RESET button to reset alarms. When an alarm occurs, the LEDs will blink in a certain way (see the trouble-shooting section of this manual), and the RESET button will glow red.*
2. *Increase capacity button. Pressing this button increases the capacity of the humidifier in increments.*
3. *DRAIN button for manual drain selection. Push and hold to force the unit to drain all water.*
4. *30% steam output level indicator.*
5. *50% steam output level indicator.*
6. *75% steam output level indicator.*
7. *100% steam output level indicator.*
8. *Unit humidifying indicator.*
9. *High water level indicator.*
10. *Unit filling indicator.*
11. *Unit draining indicator.*

The Main Control Board

Inside your MiniSteam humidifier is the main control board. It has similar functions to the keypad on the front of the unit.

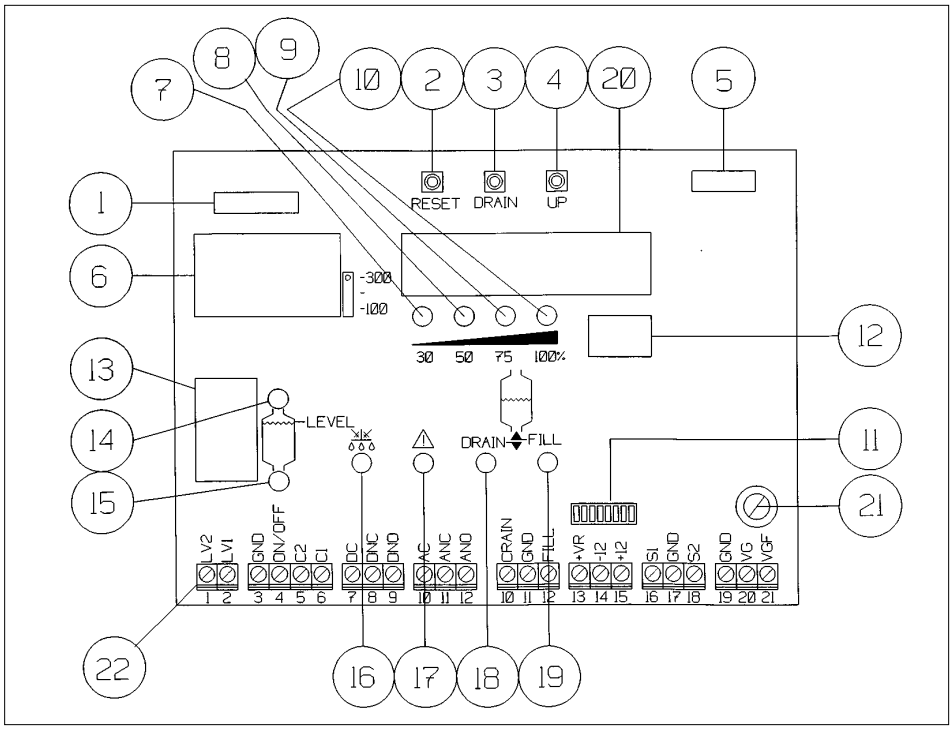

Figure 30

Setting Maximum Steam Output: Press the UP key until the appropriate LED on the output graph lights up. Once for 30%, two times for 50%, three times for 75%, and four times for 100%. This setting can be used to reduce the output of the humidifier for applications where the full output may not be needed.

1. *Connector for the front keypad*
2. *RESET button*
3. *DRAIN button for manual draining*
4. *UP button to increase capacity*
5. *Serial connection for "smart homes"*
6. *Amperage transformer*
7. *30% steam output level indicator.*
8. *50% steam output level indicator.*
9. *75% steam output level indicator.*
10. *100% steam output level indicator.*
11. *DIP switches to select signal input.*
12. *Configuration EEPROM.*
13. *Power relay.*
14. *Unit humidifying indicator.*
15. *High water level indicator.*
16. *Dehumidify indicator.*
17. *Alarm indicator.*
18. *Unit draining indicator.*
19. *Unit filling indicator.*
20. *Microprocessor.*
21. *Conductivity adjustment.*
22. *Terminal connectors.*

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Maintenance

Although your MiniSteam humidifier is designed to take care of its normal operation, and even to provide you with diagnostic capability, good operation always means good maintenance. Periodic cleaning or replacement of the steam generating cylinder, and cleaning of the fill and drain valves is required as indicated by the controller with a "worn out cylinder alarm.

Also, at the end of each humidification season, it is good practice to shut off the humidifier and manually drain the cylinder of water to prevent premature rusting and corrosion of the electrodes during the nonuse season.

Cleaning the steam cylinder:

1. *Drain the steam cylinder of all water by pressing and holding the DRAIN button on the controller until the cylinder is completely empty.*

2. *Shut off the humidifier with the On/Off switch on the front, and disconnect power to the unit at the external fused disconnect.*

CAUTION: *If you have a blower unit, there may be more than one disconnect.*

3. *Loosen the hose clamp around the steam hose on top of the steam cylinder and remove the hose. Loosen the steam cylinder hold-down clamp.*

4. *Remove the power wires on the top of the steam cylinder and also the red cylinder full probe connectors, and lift the steam cylinder straight up out of the drain fitting, and then out of the humidifier.*

5. *To clean the cylinder, wash out all heavy mineral by inverting the cylinder and flushing water through the bottom drain outlet. Then fill the cylinder with either a 5% phosphoric acid solution (humidifier cleaner), or a 50% solution of Lime-Away . If the electrodes are too badly corroded, replace the entire steam cylinder.*

6. *Reinstall the cylinder in the humidifier unit and connect all wires, being sure to get them tight.*

CAUTION: *loose cylinder wires can become hot and melt the cylinder or cause fires.*

Cleaning the fill and drain valves:

After shutdown and removal of the steam cylinder, shut off the water supply to the humidifier, disconnect the water supply and remove the fill valve from the humidifier. Remove the inlet strainer by reaching up into the fill valve inlet with a pair of needle nose pliers and pulling out the strainer by its tab. Clean the fill valve and inlet strainer using the same solution as used to clean the steam humidifier, but DO NOT soak the solenoid coil in fluid.

Reinstall the fill valve. (Figure 31)

WARNING: When cleaning the fill valve, do NOT poke or probe flow regulator with any object which may enlarge the orifice. The flow regulator must meter water flow precisely or shortened cylinder life may result.

Remove the drain valve group and disassemble it. Clean all parts in the same way as the fill valve, reassemble and reinstall. (Figure 32)

After cleaning and reassembly, restart your humidifier according to the Startup Instructions contained in this manual.

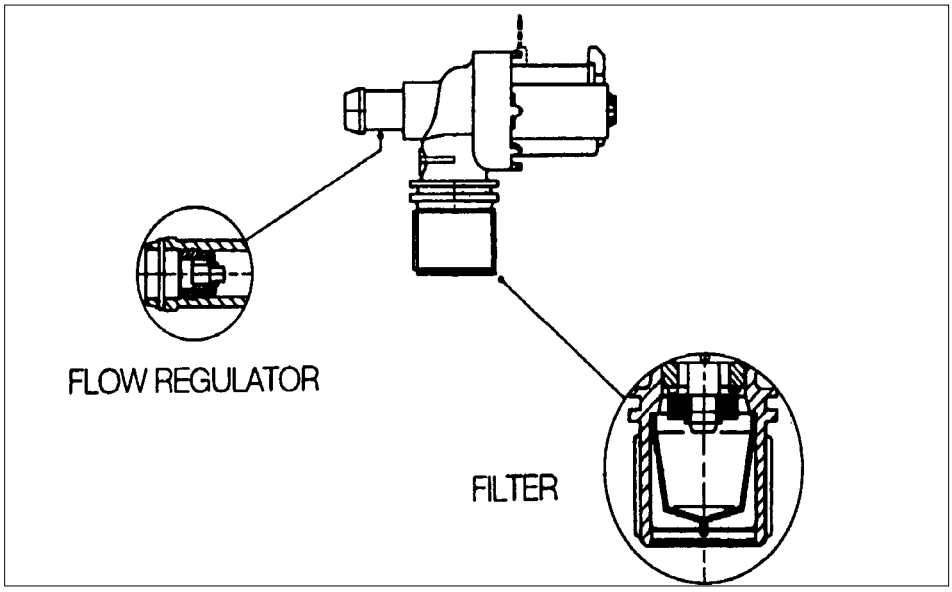

Figure 31

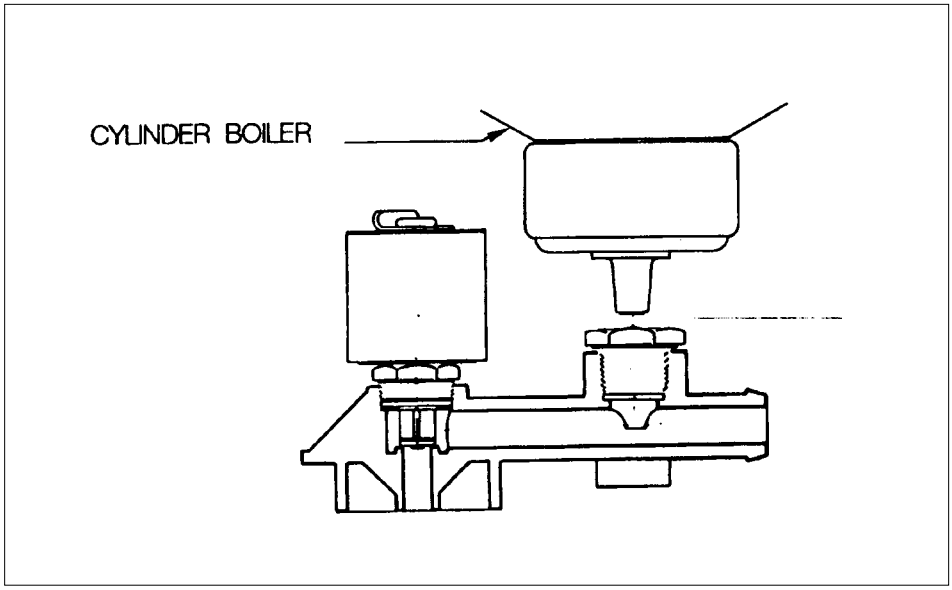

Figure 32

NOTE: *It is highly recommended to shut down and manually drain the humidifier during any periods of seasonal non-use. Allowing water to remain in contact with the electrodes for long periods of time will promote premature rusting and deterioration of the electrodes. Algal growth in the cylinder during periods of non-use may also result in an odor being produced on restart.*

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Alarms and Fault Conditions

When an alarm appears, it must be cleared by pressing the RESET button on the controller. If the alarm condition still exists, the alarm will continue.

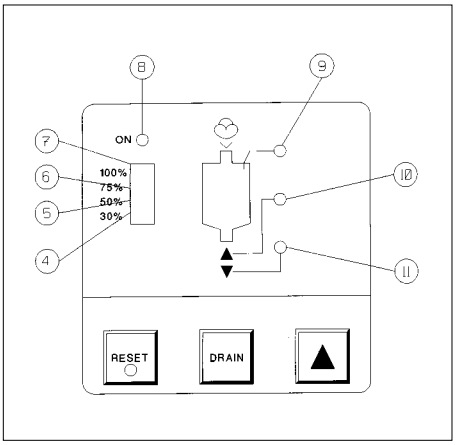

Figure 33

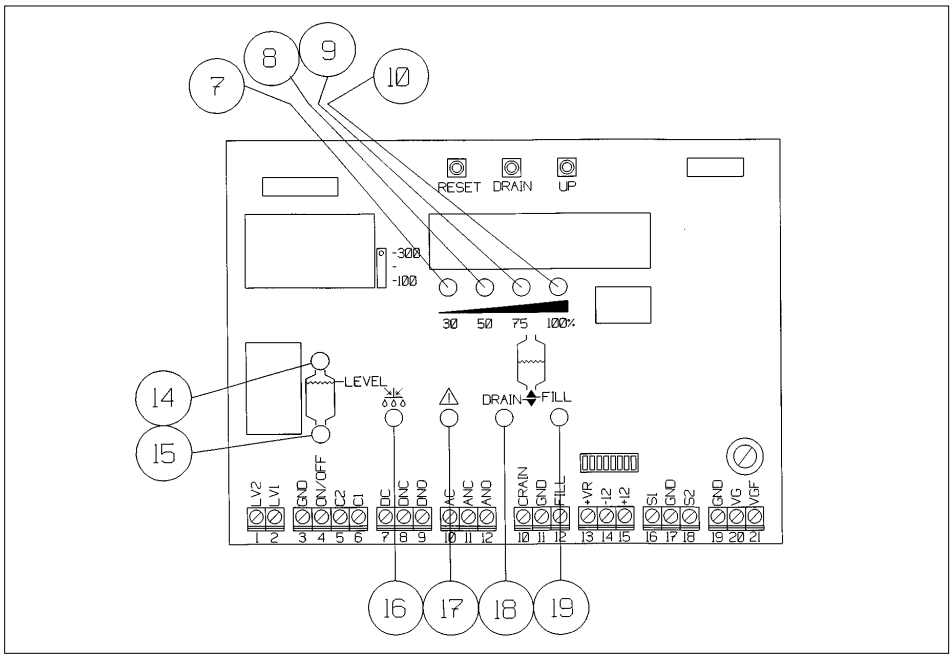

Figure 34

DEFINITION	FACE PAD	CONTROLLER
PRE-ALARMS		
Lack of water	*LED #7 blinks*	*LED #18 blinks*
Faulty drainage	*LED #8 blinks*	*LED #19 blinks*
Worn out cylinder	*LED #6 blinks*	*LED #15 blinks*
ALARMS		
Lack of current	*LED #5 blinks*	*LED #14 blinks*
High current	*LEDs #1-2-3-4 blink*	*LEDs #7-8-9-10 blink*
Data error	*LEDs #3-4 blink*	*LEDs #9-10 blink*
Faulty sensor	*LEDs #2-3-4 blink*	*LEDs #8-9-10 blink*
EEPROM configuration error	*LEDs #1-2 blink*	*LEDs #7-8 blink*
Power supply of controller	*LEDs #1-4 blink*	*LEDs #7-10 blink*

ERROR	POSSIBLE CAUSES	POSSIBLE CORRECTIONS
Lack of water: the fill valve has remained energized for more than 20 minutes without any increase in amperage	*- water turned off - fill valve obstructed - fill strainer obstructed - no power to fill valve*	*- make sure water is on - clean fill strainer - check wires/power to valve - replace fill valve*
Faulty drainage: the drain valve remains open for more than 2 minutes without a decrease in water level	*- drain valve obstructed - mineral bridge in cylinder - cylinder screen clogged - no power to drain valve*	*- check drain valve and screen for obstruction - clean or replace cylinder - check wires/power to valve - replace drain valve*
Worn out cylinder: output has not risen above 50% in more than 72 hours	*- electrodes coated - drain screen full of mineral*	*- clean or replace cylinder*
Lack of current: cylinder is full of water and there has been no current for at least 20 minutes	*- one or more electrodes has lost power - amperage transformer broken - contactor broken*	*- check all fuses - replace amperage transformer - replace contactor - check external power*
High current: the current exceeds the safety threshold by 170%	*- mineral bridge on electrode - leaking fill valve - drain valve obstructed*	*- clean or replace cylinder - clean or replace fill valve - clean or replace drain valve*
Data error: conductivity, amperage or humidity sensor input value is out of range	*- loose/bad wiring connection - DIP switches set improperly - faulty humidity sensor*	*- check all wiring connections - check DIP switch settings - replace main board - replace humidity sensor*
Faulty sensor: the sensors value is out of range	*- loose/bad wiring connection - DIP switches set improperly - sensor broken or needs calibration*	*- check all wiring connections - check DIP switch settings - replace or recalibrate humidity sensor*
EEPROM configuration error:	*- main board programmed wrong - DIP switches set improperly*	*- check DIP switch settings - replace main board*
Power supply of controller: the secondary 24 Vac voltage falls 10% below	*- reduction of incoming power - faulty transformer - internal short*	*- check incoming voltage - check wiring for shorts - replace transformer*

Other Trouble-Shooting Hints:

1. The water in the cylinder turns black: *This is usually an indication that the minerals in the cylinder have over-concentrated and the pH of the water has dropped causing a deterioration of the electrodes. Left unchecked, this will lead to a very short cylinder life. Check for low spots or kinks in the steam hoses that could cause a back pressure on the cylinder. Check the duct static pressure. Check the fill valve and inlet strainer. Check the drain valve operation. Contact the factory.*

2. Heavy arcing occurs within hours of startup: *The feed water contains large amounts of Iron, Copper or other conductive contaminants. Contact the factory for an optional drain timer to force additional drains to control the minerals. If you are using a softener, check the salt being used. If it contains any additives, discontinue use, flush all lines and convert to pure salt or pipe raw, unsoftened water to the humidifier. It is usually best NOT to use softened water. Check the electrodes in the cylinder to be sure they were not damaged in shipping.*

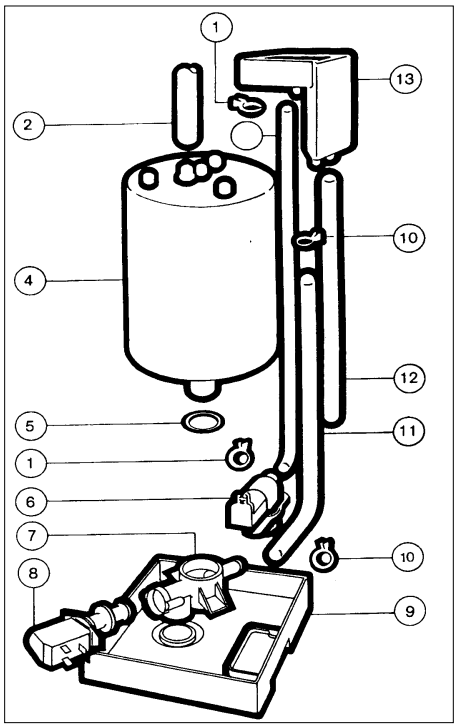

Figure 35

Replacement Parts - Humidifier Unit

1: *Hose snap clamp*
2: *Steam hose SH75*
3: *Rubber pipe 1312345AXX*
4: *Steam cylinder L200MA*
5: *Cylinder O-ring*
6: *Fill valve kit 9995642ACA*
7,8: *Drain valve kit KITVSCOMP0*
9: *Bottom tank*
18: *C344A004*
10: *Hose snap clamp*
11: *Rubber pipe*
13: *12348AXX*
12: *Rubber pipe*
13: *12345AXX*
13: *Fill cup 13C119A003*

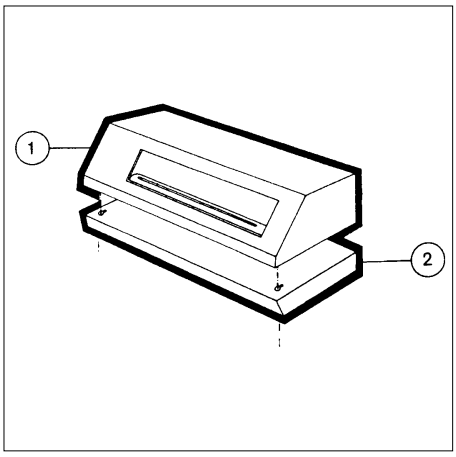

Figure 36

Replacement Parts - Blower Unit

1: *Ventilator unit VRDC*
2: *Remote base VRDC BASE*

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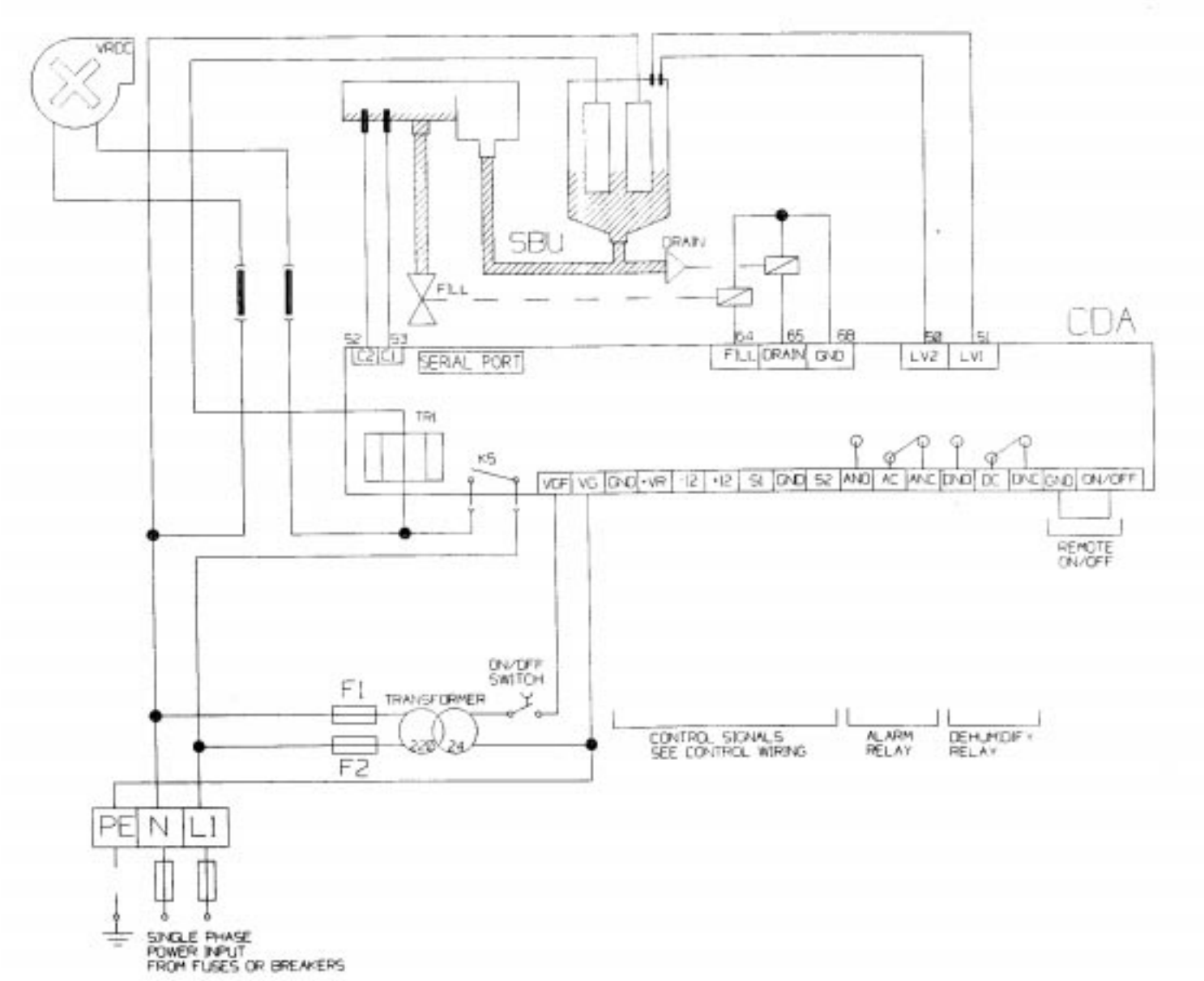
Humidifier Wiring Diagram



DGH Systems, L.L.C.

Technical Specifications

Capacity:	7 lbs/hr
Voltage:	220/1/60
Amperage:	10.6 Amps
Power Use:	2.2 kW
Water Pressure:	15-100 psi
Conductivity:	125-1250 micromhos
Shipping Weight:	TECHNICAL SPECIFICATIONS
Capacity:	7 lbs/hr
Voltage:	220/1/60
Amperage:	10.6 Amps
Power Use:	2.2 kW
Water Pressure:	15-100 psi
Conductivity:	125-1250 micromhos
Shipping Weight:	RD103CL220 = 45 lbs.
	RF103CL220 = 50 lbs.
Dimensional data:	14 3/4" High X 11" Wide X 7 1/2" Deep
Steam Nozzle:	High temperature fibreglas
Steam Hose:	Non-conductive, high temperature silicone
Feed Water Temp:	<= 120 F
Feed Water Connection:	1/4" OD compression
Drain Water Connection:	3/4" FPT
Max. Water Use:	1.2 gph
Blower Capacity:	317 CFM, 38.5 dBNR
Blower Power Use:	20 Watts

MS2000

MiniSteam Residential
Owner's Manual

For more information call

1-800-DGH-4649

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Leadership in Humidification

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